

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI
SHRI PUNDLIK MAHARAJ MAHAVIDYALAYA, NANDURA (Rly.)
DEPARTMENT OF ZOOLOGY
B.Sc-I, SEMESTER-II
SYLLABUS
SUB: CELL AND DEVELOPMENTAL BIOLOGY

There shall be following paper and practical for B.Sc. Part-I Semester One examination. The syllabus is based on 6 theory periods and six practical periods per week (Total 75-80 theory Sessions and 25 practical sessions during the complete semester). There shall be one compulsory paper of 3 hours duration, in theory as stated below and practical examination extending for four hours. Every examinee shall offer the following paper of 100 marks, (Out of which 80 marks will be for written examination and 20 marks for internal assessments) and practical examination of 50 marks. Candidates are required to pass separately in theory and practical examination.

Marks

1) Paper-I: Cell and Developmental Biology...	
Theory (Written)	80
Internal assessments	20
2) Practical:	50
Total :	150 Marks

THEORY

UNIT-I:

1. General organization of Prokaryote and Eukaryote Cell.
2. Ultra structure and functions of, Plasma membrane
3. Ultra structure types and functions of, Endoplasmic reticulum

UNIT-II:

1. Ultra structure and functions of, Golgi complex
2. Ultra structure and functions of Ribosome
3. Ultra structure and functions of Mitochondria.
4. Ultra structure and functions of Lysosomes.

UNIT-III:

1. Ultra structure and functions of nucleus and nucleolus.
2. Chromosome and its general organization.
3. Structure of Polytene and Lamp brush Chromosome.

UNIT-IV:

1. Mitosis and its significance
2. Meiosis and its significance.
3. Gametogenesis: Spermatogenesis and oogenesis
4. Fertilization: Types of fertilization, Mechanism of fertilization,

UNIT V:

1. Cleavage, and development up to coelome formation in amphioxus
2. Cleavage, Blastulation and gastrulation up to the formation of three germ layers in Frog, Fate map.
3. Cleavage, Blastulation and gastrulation up to the formation of three germ layers in chick.
4. Extra embryonic membranes in chick: Development and significance.

UNIT-VI:

1. Placentation in mammals; Types and Functions of Placenta.
2. Parthenogenesis: Types and, Significance,
3. Regeneration in invertebrates and vertebrates.
4. Elementary idea of, sources, types and use of Stem cells.

PRACTICAL

I) Cell Biology:-

1. Use, care and maintenance of microscope.
2. Bacterial Culture, Gram staining.
3. Permeability tests using erythrocytes.
4. Preparation of Polytene chromosome in Chironomous or Drosophila larva.
5. Preparation of various stages of mitosis in Onion root tip.
6. Preparation of various stages of meiosis in insect's testis.

II) Developmental Biology:-

1. Study of stages of Gametogenesis in rat/frog, (Permanent Stained Slides)
2. Study of different of types animal eggs
3. Study of developmental stages (Life Cycle) of Cockroach, Housefly, mosquito, Butterfly, Moth, Frog (Any Four).
4. Sperm in physiological saline using phase contrast optics.
5. Demonstration of developing chick through available resources.
6. Developmental stages of frog: Cleavage, blastula, gastrula, neurula, and tadpoles through available resources.
7. Permanent slides of chick embryos at 24, 36, 48, 72 hrs of incubation.
8. Study of different types of placenta with suitable histological slides or visual diagrams.

Distribution of Marks during Practical Examination:

Time : 4 hrs.	Marks
i) Identification and comments on spots (1-8) – 4 Cytological, 4 Embryological	16 Marks
ii) Cytological Preparation.....	10 Marks
iii) Comments on given Life Cycle.....	10 Marks
iv) Certified class record -.....	05 Marks
v) Submission of photographs of any three crop pests.....	04 Marks
vi) Viva- voce.....	05 Marks

Total:- ...50 Marks

List of necessary Equipments / Apparatus required for the Zoology Practical.

1. Compound Microscope - 16
2. Dissecting Microscope - 16
3. Dissection Box - 02
4. Dissecting Trays - 25
5. Phase contrast microscope - 01
6. Computer set with LCD.
7. Glass aquarias - 3
8. Dissection Accessories.
9. Scale reader
10. Hot air oven.
11. Weighing Balance (Single Pan Balance)
12. Refrigerator

Reference

1. C.B.Pawar ;Cell Biology :
2. Alberts Bray, Lewis, Raff, Roberts and Watman Molecular Biology of the cell (Garland)
3. Balinsky, An introduction to Embryology, (CBS College Publishers)
4. Grant: Biology of developing system (Halt, Reihart and Winston.)
5. Gilbert: Developmental Biology (Sinauer)
6. Puranik P. G., A Text Book of Embryology S. Chand & Co.
7. Browder L.W. Erickson C.A. & Williams Developmental Biology, 1992 3rd edition, R J. Saunders // . College, Publications, London
8. Tyagi, Verma and Agrawal: Chordate embryology.
9. Dr.R.A.Malu, et.al Text Book of Cell Biology and Developmental Biology - Shivneri Publishers, Amravati.
10. Korak Kanti Chaki, Gautam Kundu, and Supriti Sarkar: Introduction to General Zoology Vol. 1 and Vol.2
11. De Robertis Cell and Molecular biology